Patent Claims

1. A method for the identification and/or quantification of endothelial cells being related to cardiovascular diseases in a sample, wherein the method comprises the following steps:
(a) obtaining a sample to be analyzed containing endothelial cells;
(b) incubating the sample with one or several molecules that specifically bind to one or several of the following marker molecules of the endothelial cells:
- endothelial cell-markers and/or markers for apoptosis, or
- endothelial cell-markers and/or markers of endothelial precursor cells;
(c) identification and/or quantification of the endothelial cells on the basis of the bound molecules by using immunocytological methods; and
(d) comparing the result obtained for the sample to be analyzed with the result of a reference sample.

2. Method according to claim 1, wherein said endothelial cells are derived from a mammal, in particular from a human.

3. Method according to claim 1 or 2, wherein said endothelial cells are selected from the group consisting of apoptotic endothelial cells, endothelial precursor cells, and mature endothelial cells.

4. Method according to any of claims 1 to 3, wherein said sample to be analyzed is selected from the group consisting of peripheral blood, cell culture-suspensions and suspensions containing cells that have been released mechanically, chemically and/or enzymatically from the wall of a vessel.

5. Method according to claim 4, wherein said sample to be analyzed is peripheral blood.

6. Method according to claim 5, wherein a coagulation inhibitor, in particular heparin, is added to the peripheral blood.

7. Method according to any of claims 1 to 6, wherein said marker-binding molecules are selected from the group consisting of antibodies or parts or fragments thereof, and receptor ligands or parts thereof.

8. Method according to claim 7, wherein said antibodies or parts or fragments thereof comprise polyclonal antibodies, monoclonal antibodies, Fab-fragments, scFv-fragments, and diabodies.

9. Method according to any of claims 1 to 8, wherein said marker-binding molecules are present in solution or matrix-immobilized.

10. Method according to any of claims 1 to 9, wherein said marker-binding molecules are coupled to one or several detection molecules from the group consisting of fluorescein thioisocyanate, phycoerythrine, enzymes, and magnetic beads.

11. Method according to any of claims 1 to 10, wherein said marker-binding molecules are detected with an antibody being coupled to one or several detection molecules.

12. Method according to any of claims 1 to 11, wherein said endothelial cellular marker is selected from the group consisting of CD146, von Willebrandt-factor (vWF), and vascular endothelial growth factor-receptor 1 (VEGF-receptor-1).

13. Method according to any of claims 1 to 12, wherein said marker for apoptosis is selected from the group consisting of annexin V, and PD-ECGF.

14. Method according to any of claims 1 to 13, wherein said markers of endothelial precursor cells are selected from the group consisting of CD133 and CD34.

15. Method according to any of claims 1 to 14, wherein furthermore at least one marker being characteristic for non-endothelial cells is determined, such as, for example, CD45.

16. Method according to any of claims 1 to 15, wherein said immunocytological methods are selected from the group consisting of flow cytometry and solid-phase-immunoassays.

17. Method according to any of claims 1 to 16, wherein said reference sample is derived from a mammal, wherein a cardiovascular disease was excluded.

18. Method according to any of claims 1 to 17, wherein said result for apoptotic endothelial cells is brought in relation with the result for the totality of endothelial cells.

19. Method according to any of claims 1 to 17, wherein said result for apoptotic endothelial cells is brought in relation with the result for the endothelial cells.

20. Method according to any of claims 1 to 19, further comprising a lysis of the erythrocytes between step (a) and (b).

21. Method according to any of claims 1 to 20, wherein said cardiovascular diseases are selected from the group consisting of stable and unstable angina, myocardial infarction, acute cardiac syndrome, coronary arterial disease and heart insufficiency.

22. Diagnostic kit, comprising means for performing the method according to any of claims 1 to 21, optionally together with additional components and/or excipients.

23. Use of the method according to any of claims 1 to 21 for the diagnosis and/or prognosis of cardiovascular diseases and/or for the monitoring of their therapy.

24. Use according to claim 23, wherein said therapy comprises the administration of lipid lowering substances, selected from the group consisting of statines, in particular atorvastatin.